

# Uganda

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## Estimation of Commodity Requirements for 2002–2004

### Drugs to Treat Sexually Transmitted Infection

Prepared for the Ministry  
of Health, Uganda

Yasmin Chandani

September 2002

Uganda Ministry of Health





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## **DELIVER**

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## **Abstract**

Explains the quantification methodology used for estimating the need for sexually transmitted infection (STI) drugs in the public and NGO sectors in Uganda from 2002–2004. The results of the drug assessment showed that, for STI purposes, some drugs would be oversupplied, while other drugs would be undersupplied. Short-term and long-term recommendations are included.

Uganda Ministry of Health



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# Contents

Acronyms.....	v
Acknowledgments.....	vii
Executive Summary .....	ix
Short-term Recommendations .....	x
Mid- to Long-term Recommendations .....	x
Overview: Commodity Financing in the Public Sector .....	3
1. Essential Drugs .....	3
2. STI and OI Drugs .....	4
3. Malaria Drugs .....	4
4. Tuberculosis Drugs .....	5
5. HIV Test Kits.....	5
Quantification of Drugs for Syndromic Management of STIs .....	7
Background.....	7
Assumptions .....	7
Recommendations .....	13
General Recommendations .....	13
STI Program .....	13
Quantification.....	13
Procurement and Financing .....	14
Distribution .....	14
Information Systems.....	14
Appendices .....	
A. People Contacted.....	15
B. Treatment Algorithms for the Major STD Syndromes .....	19
C. Methodology for Quantifying STI Drugs for Syndromic Management .....	23
Tables .....	
1. Estimate for Number of Women Treated for STIs .....	9
2. Estimate for Number of Men Treated for STIs .....	9
3. Estimates for Pregnant Women Treated for Syphilis .....	9
4. Quantities of STI Drugs Still Required between May 2002–April 2003 for Syndromic Management in Public and NGO Sectors .....	10
5. Estimated Quantities of STI Drugs Required between May 2003–April 2004 for Syndromic Management in Public and NGO Sectors .....	11
6. Quantifying to Order: STI Drugs, Laboratory Tests and Reagents, Expendable Medical Fixed Supplies .....	25
7. Quantity to Order.....	30
8. Summary Cost Estimate.....	31
9. Quantity to Order.....	32
10. Summary Cost Estimate.....	33



# Acronyms

ACP	AIDS control program
AIC	AIDS Information Centre
AIDS	acquired immune deficiency syndrome
AIM	USAID-funded district based AIDS project
CBD	community-based distribution
CDC/GAP	Centers for Disease Control and Prevention/Global AIDS Program
CPR	contraceptive prevalence rate
DANIDA	Danish International Development Agency
DFID	British Department for International Development
DHS	Demographic and Health Survey
ED	essential drugs
EDP	essential drug program
EGPAF	Elizabeth Glaser Paediatric AIDS Foundation
EU	European Union
GFATM	Global Fund for AIDS, TB and malaria
GLRA	German Leprosy Relief Association
GOU	Government of Uganda
GTZ	<i>Deutsche Gesellschaft für Technische Zusammenarbeit</i> (German international development agency)
HC	health center
HIV	human immunodeficiency virus
HIV/AIDS	see HIV and AIDS
HSSP	DANIDA-funded Health Sector Support Project
JMS	joint medical stores
JSI	John Snow, Inc.
LMIS	logistics management information system
MAP	Multi Country AIDS Program
MOH	Ministry of Health
MOS	months of supply
MTCT	mother-to-child transmission (used by researchers and funders)
NBTU	Nakasero blood transfusion unit
NGO	nongovernmental organization
NMS	National Medical Stores
OI	opportunistic infection
OJT	on-the-job training
PHC	primary health care
PHC-CG	primary health care conditional grants
PMTCT and PPTCT	preventing MTCT or PTCT
PMTCT+	beyond preventing MTCT, considering the family
PSI	Population Services International
RH	reproductive health
SDP	service delivery point
SLA	senior logistics advisor (FPLM)
SOH	stock on hand
STI	sexually transmitted infection
SWAp	Sector Wide Approach
TASO	The AIDS support organization

UAC	Uganda AIDS Commission
UNAIDS	United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
VCT	voluntary counseling and testing (HIV)
WB	World Bank
WHO	World Health Organization (Geneva, Switzerland)



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The views stated in this report are those of the authors, and do not necessarily reflect the views of the U.S. Agency for International Development or the Uganda Ministry of Health.



# Executive Summary

Funding sources for procuring commodities for HIV/AIDS programs are increasing in Uganda and include the Ministry of Health budget, the World Bank supported Multi-Country AIDS Program (MAP), the Global Fund for AIDS, Tuberculosis and Malaria (GFATM), and resources from donors and foundations. Without a systematic attempt to quantify commodities for all HIV/AIDS programs, and coordinated procurement and ordering, however, there is a great risk of less than optimal use of resources through duplicate and incorrect orders.

As part of expanding its HIV/AIDS services, the MOH/U will channel new funds toward purchasing a wide range of commodities, including laboratory reagents (HIV test kits, syphilis RPR kits); as well as drugs for treating sexually transmitted infections (STI), tuberculosis (TB), opportunistic infections (OI), and anti-retrovirals (ARV), either as a single dose for prevention of mother-to-child transmission or as combination therapy. This report provides details about the quantification methodology used for estimating needs of STI drugs in the public and NGO sectors in Uganda from 2002–2004. Separate reports exist or will be compiled for each of the other categories of commodities.

Although estimates of STI drug requirements had already been prepared by the program, these were budget-driven rather than need-based and did not reflect actual demand or past consumption. There was a significant dearth of hard data on past consumption, partly due to prolonged stockouts after the termination of the previous World Bank STI project in 2000. Thus, the quantification process relied heavily on the expertise and knowledge of many key stakeholders, including the Uganda AIDS Commission (UAC), the Ministry of Health AIDS Control Program (MOH/ACP), the National Medical Stores, Joint Medical Stores, and the Centers for Disease Control and Prevention/Uganda (CDC).

After extensive consultation with stakeholders and review of available records, the required quantities and assumptions made in arriving at these quantities were presented to program managers and STI technical staff. Because of the scarcity of hard data, the quantification is based on a series of generally liberal assumptions related to staff, training in the revised syndromic management algorithm, prevalence rates, and overlap of drug use for STIs and other purposes. If some of these positive assumptions are not met, the proportional quantities of STI drugs might have to be adjusted. Another important point to keep in mind is that, given alternative uses of these same drugs for other health problems, tracking the accuracy of the forecast will be difficult.

The team found that benzathine penicillin, doxycycline, cotrimoxazole, and erythromycin ordered with MAP funds will be oversupplied for STI purposes, partly due to changes in the treatment algorithm after the order was placed. In contrast, ciprofloxacin, metronidazole, nystatin pessaries, aciclovir tablets, and RPR test kits for syphilis will be undersupplied for the period May 2002–April 2003, if the projections prove accurate.

Approximately, an additional \$4.1 million will be required to purchase STI drugs and consumables for 2002–2003 and about \$10.5 million for STI drugs and consumables in 2003–2004. The projections should be carefully reviewed before making final purchasing decisions. However, there is an urgent need to place the order for the 2002–2003 commodities, to reduce the chances of a stockout. Similarly, the 2003–2004 procurement process should be started soon to ensure the continuity of supply of these items.

The most serious concern were the delays in receiving some of the drugs (notably metronidazole) because the manufacturer that won the tender was not able to get the products registered by the National Drug Authority (NDA) by the due date.

The team's recommendations include the following:

## **Short-term Recommendations**

- Validate projections with STD/ACP program staff. Given the liberal nature of the assumptions, thoughtful consideration should go into using the projections as a starting point from which to make future procurement decisions
- Begin to identify possible funding sources for U.S.\$3.8 million required to supply sufficient drugs to meet demand for STI services in 2002–2003 (table 4), in case funds from the GAFTM are not sufficient.
- Liaise with the STD/ACP unit and pharmacy unit to develop a distribution plan for incoming STI drugs.
- Although consumption of all STI drugs should be closely monitored to validate assumptions made for the quantification, and to help with future forecasts, particular attention should be paid to consumption of erythromycin. If prescribing practices do not change relatively soon, as stated in the assumptions, then more quantities of erythromycin may need to be ordered.
- Strengthen STI sentinel site reporting to increase data availability for quantification and other program management interventions.

## **Mid- to Long-term Recommendations**

- Expedite the development and maintenance of a central commodity database to keep track of all MOH and donor inputs for essential health commodity supplies. This information has been, and is likely to continue to be, crucial in alerting commodity management donors and stakeholders about impending stockouts or shortages in various product categories.
- Explore the inclusion of STI drugs and financing mechanism in the MOH/pharmacy and UHSSP transition from push to pull system, beginning in January 2003, aimed at assisting districts to quantify their own needs. This could be a first step towards integrating the supply of STI drugs into the essential drug system.
- Given that developing a traditional model of a centralized LMIS is not possible in the Uganda environment, work with NMS to use order quantities, stock-on-hand, and high-quality issues data that could be validated by quick surveys at the time national forecasts are conducted.
- MOH, UAC, WB, and NDA staff to communicate regularly on shipment status of awarded tenders to ensure that potential delays of incoming commodities, whether through delayed registration or other causes, are identified early enough for timely resolution.

# Background

The Government of Uganda (GOU) estimates that the antenatal HIV prevalence is 6.1 percent and approximately 1.1 million people with HIV/AIDS are living in the country. Growing government commitment and nongovernmental organizations involvement, coupled with strong support from international donor organizations, has contributed to both a reduction in prevalence and an increase in HIV/AIDS knowledge and program development. However, there is a need to greatly expand the range and quality of prevention, and care and support interventions to continue the progress that has been made.

The availability of HIV/AIDS commodities will be central to the effort to expand the range and quality of services being offered. To ensure the consistent and reliable availability of these commodities to customers, programs must, in the medium- to long-term—

- Be able to quantify their commodity needs.
- Have or orchestrate resources to ensure procurement of these commodities.
- Have or access skills to procure these commodities.
- Deliver the commodities reliably to all customers along the supply chain.

Recognizing this, the GOU/Ministry of Health (MOH) has requested the DELIVER/Uganda project to assist in coordinating the quantification of the range of commodities required by HIV/AIDS programs. This quantification will provide a detailed justification for all HIV/AIDS commodity requirements across both the public and civil society sectors for 2002 and 2003. Currently, there are several funding sources that are and can be used to procure commodities for HIV/AIDS programs, including the MOH budget, the World Bank supported Multi-Country AIDS Program, funds from the Global Funds for AIDS, Tuberculosis and Malaria (GFATM), and resources from donors and foundations. Without a systematic attempt to quantify commodities for all HIV/AIDS programs and a coordination of procurement and ordering, however, there is a great risk of less than optimal use of resources through duplicate and incorrect orders.

Many commodities included under the umbrella of HIV/AIDS are already on the essential drugs list, which are used specifically by HIV/AIDS program components (e.g., sexually transmitted infection [STI], tuberculosis, and opportunistic infection [OI] drugs), as well as other purposes. Thus, this document will focus on HIV/AIDS program logistics and commodities while referencing other public health commodities, where appropriate, given GOU's long-term goal to integrate supply and logistics systems for health programs.

Key stakeholders involved in implementing HIV/AIDS prevention and treatment programs include the Uganda AIDS Commission (UAC), the Ministry of Health AIDS Control Program (MOH/ACP), and the Uganda Blood Transfusion Unit; nongovernmental organizations (NGOs), including the AIDS Information Center (AIC) and The AIDS Support Organization (TASO); and other cooperating agencies, such as the Centers for Disease Control and Prevention (CDC) and AIM Uganda.



# Overview: Commodity Financing in the Public Sector

In general, financing for commodities used in public sector facilities combines MOH and donor funds. Donors can contribute in two ways: (1) through Sector Wide Approach (SWAp) funding via budget support to the Ministry of Finance; or (2) through provision of in-kind contributions, such as direct supplies of commodities to specific programs. To date, there has been no central mechanism or section of the MOH that keeps track of all the various donor inputs, in terms of commodity supplies. However, DELIVER/Uganda is currently working with the pharmacy section to establish a commodity tracking database that will maintain records of all donor commodity inputs.

The following is an approximate summary of funding sources, by program, for commodities in the public sector in Uganda. The focus is on commodity inputs for lower-level health units (HC II, III, and IV) and not on district, regional, and referral hospitals.

## 1. Essential Drugs

Health units currently obtain essential drugs and supplies in the following ways:

- Pre-packed EDP kits, which are procured centrally and distributed to all public sector health facilities on a quarterly basis. Funding for the 30–40 essential drugs included in the kit has come from GOU and DANIDA, through its HSSP project. The content of the kits has recently been updated to more accurately reflect health facility needs. The supply of drugs in the kit is generally insufficient for health unit needs' and only lasts 1–1.5 months.
- Direct purchases by the district or health units using funds from the primary health care conditional grants. In theory, after the funds have been released, 50 percent are available for drug purchases to supplement supplies in the kit. In practice, delays in the release of funds and reporting requirements on use of the funds have led to limited use of PHC-CG grants for purchasing drugs.

Even if the full amount allocated for drugs from the PHC-CG grants were released regularly, funding is still not sufficient for drug needs at the lower levels. A recent study conducted by MOH/pharmacy section and UHSSP demonstrated that districts require approximately U.S.\$2.40 per capita to provide sufficient commodities for the minimum package of services that GOU has committed to providing for Ugandans. Currently, including all GOU and partner direct and in-kind contributions, only about U.S.\$0.96 per capita is being spent on commodities.

To address the issue of irregular and insufficient supplies, the pharmacy section is planning a phased transition to a comprehensive order-based system for essential health commodities. The transition to the new “pull” system will begin in January 2003. Key elements of the new system include—

- To instill the idea of a “value” for the kit among lower level health units, DANIDA/GOU funding for essential drugs will be a budget line equal to the value of the imported kit.
- During the transitional period, health units can use the budget line to purchase locally assembled kits until they have sufficient capacity to estimate their requirements and place orders for individual items.

- Eventually comprehensive orders will be placed using funds from both the essential drugs budget line and the PHC-CG budget, and each health unit will have separate accounts at NMS/JMS.
- Donated products for vertical programs will be integrated onto the order form for the pull system to encourage systematic orders to be placed by each health facility for all its commodity needs.

## **2. STI and OI Drugs**

Funding for these supplies has been erratic in the last several years. Initially, the World Bank STI project (1995–2000) supplied condoms for STI/HIV prevention, drugs for STI syndromic management, TB treatment according to DOTS, and OI treatment. Other donors for these commodities during the same period included DFID and KfW. These commodities were provided to MOH, NGO, and mission sites. After the project funding ran out in 2000, a small amount of MOH funds were allocated to purchase STI drugs. This money was never used for STI drug purchases but reallocated for purchasing essential drug program (EDP) kits.

Consequently, since the end of 2000, there has been no provision of STI drugs to lower levels through the national program on a consistent basis, since the EDP kits purchased do not contain all the drugs required for syndromic management of STIs. In theory, districts should have been able to obtain these drugs by ordering from NMS using their PHC-CG drug budgets. In practice, release of the PHC grants has not been timely and districts have had difficulties accessing funds after their release. Thus, it is likely that health centers have had inconsistent supplies and shortages of STI drugs. Although TB and malaria drugs were also affected by the shortages in funding, the programs have been better able to mobilize other donor resources to ensure provision of supplies.

Between April–July 2002, most of an emergency shipment, valued at U.S.\$1.3 million, of drugs for STI, TB, OI, and HIV test kits, syphilis test kits, and expendable medical supplies arrived, procured through the World Bank-assisted MAP project. Through standard non-emergency procedures, the project has also procured substantial amounts of HIV/AIDS commodities, which will be supplied through the Uganda AIDS Commission and the MOH, starting in early 2003. Although estimates were made of commodities required for treating STIs, TB, malaria, and specialized OIs, this was a budget-driven exercise rather than a systematic quantification of needs for both public and civil society sectors based on demand and a realistic assessment of Uganda's capacity to deliver services and supplies.

## **3. Malaria Drugs**

The main funding source for anti-malarial drugs is the government via budget support to the treasury from donor agencies. This money, the conditional PHC grant, is, in turn, supplied to the district health departments. After district health departments are informed of their allotment, they are required to spend 50 percent of the amount on drugs, part of which is spent on anti-malarials. Districts and health units also receive anti-malarial drugs in the pre-packed EDP kit.

In times of crisis, donor agencies have been known to purchase anti-malarial drugs directly on behalf of the government, and supply them to the MOH for distribution. WHO provided this support during a malaria epidemic in the late 1990s. On the whole, however, there is no coordinated approach to donor support of the malaria program.

Most recently, with the change in policy of chloroquine (CQ) and sulphadoxine-pyrimethamine (SP) as first-line treatment, as of July, the MOH did not plan for additional anti-malarial drugs to be purchased under the MAP project. This has resulted in low stock levels of both first-line and second-line treatment drugs, especially sulphadoxine-pyrimethamine. The issue of an impending stockout was discussed at the joint



meeting of MOH and donors in April, and DfID and Irish AID both agreed to step in and fill the gap by purchasing a one-year supply each of SP and quinine, worth \$1.2 million. As an emergency measure, a two-month supply of SP was bought locally and distributed in July and August. Another four-month supply is being air shipped in, while the remaining six-month supply will come in through a regular sea shipment. Unfortunately, the long registration process for double-scored packs of quinine has resulted in a delay in purchasing and bringing in stop-gap quinine supplies. Details on the quantification can be found in the companion report on anti-malarial drugs.

## **4. Tuberculosis Drugs**

There have been two main sources of funding for TB drugs in recent years: the MOH and the German Leprosy Relief Association (GLRA). The primary source during the later 1990s was the MOH. Between 1995 and 2000, funds from the World Bank STI Project were used to supply TB drugs. GLRA also supplied TB drugs between 1995 and 2000, especially during lapses in the MOH procurement process.

More recently (2001), the TB program has been relying on a World Bank Debt Relief Facility and GLRA to supply its TB drugs. Although the TB program expects this to change in the near future through the World Bank MAP project supplies, orders of a one-year supply of drugs through that mechanism have been delayed due to the lengthy registration process for manufacturers for the TB 4 and TB 2 blister packs.

Similarly, suppliers from the Global Drug Facility of the STOP TB fund are unable to step in and cover the potential shortage in TB drugs because products from their manufacturing site are also not registered in Uganda and the long registration process is hindering quick action in this area.

The TB program applied for funds through the Global Fund for AIDS, TB, and malaria (GFATM), but, to date, they have not received an award of funds through this mechanism.

A detailed outline of the organizational structure, management and functioning of the TB program can be found in the companion report on TB drugs.

## **5. HIV Test Kits**

In the past, HIV rapid test kits for VCT and PMCT were funded by a variety of sources, including CDC/GAP, DfID, the NORAD/UNFPA VCT Project, UNICEF, and USAID. Funding for these services and supplies is currently provided under the following sources: EGPAF, EU, Irish AID, UNICEF, USAID, and the MAP project. For the National Blood Safety program, the Nakasero Blood Transfusion Unit (NBTU) receives 40 percent of its operating budget from the European Union, and these funds are used to procure HIV ELISA test kits for testing of donated blood, hepatitis B test kits, and syphilis test kits. The remaining 60 percent of its funding is through budgetary allocations from the MOH, and this money is also used to procure supplies, such as blood bags, reagents etc. NBTU recently received support from DfID for an emergency shipment of a three-month supply of blood bags to prevent a national stockout. The certainty of continued EU funding for the program is not assured, and it is important that the unit's supply needs are quantified along with other test kit requirements.

The MOH/ACP will receive some HIV test kits through the World Bank MAP project described earlier. In addition, Uganda recently submitted a Country Proposal to the Global Fund for AIDS, Tuberculosis and Malaria (GFATM), and was awarded \$53 million in August 2002. Approximately 40 percent of the total funding submission will be used for commodity purchase, but detailed quantification of HIV test kits and other supplies is needed before final commodity purchase and detailed procurement plans can be made.

The following section summarizes the initial quantification of STI drug needs for the public and civil society sectors in Uganda for 2002–2004. This report and all the information contained therein, represents the first time a needs-based quantification has been conducted for these sectors in Uganda. Given the dearth of hard data on past consumption of STI drugs, and incidence and prevalence rates of STIs, the quantification process relied heavily on the expertise and knowledge of key stakeholders, especially at STI/ACP program within the MOH.

Because of the scarcity of hard data, the quantification is based on a series of generally liberal assumptions related to staff, training in the revised syndromic management algorithm, prevalence rates, and overlap of drug use for STIs and other purposes. If some of these positive assumptions are not met, the proportional quantities of STI drugs might have to be adjusted. Another important point to keep in mind is that, given alternative uses of these same drugs for other health problems, tracking the accuracy of the forecast will be difficult.

# Quantification of Drugs for Syndromic Management of STIs

## Background

Except in hospital settings, STIs are diagnosed and treated syndromically. A treatment algorithm for four major syndromes (urethral discharge, genital ulcer, abnormal vaginal discharge, and lower abdominal pain) was developed several years ago, and has been used by trained health workers for diagnosis. Clients are only referred for laboratory diagnosis and treatment of STIs when the first- and second-line treatment has not worked. The guidelines have undergone several rounds of revision by the MOH/STD control programme and the final version is expected to be published in September 2002 (see appendix B). This quantification was based on the draft of the recently revised guidelines.

Current data on prevalence and incidence of STIs in Uganda is extremely limited. In the 2000–2001 Uganda DHS, 8 percent of women and 3 percent of men self-reported having an STI in the previous 12 months. However, the same report documented extremely low levels of knowledge about symptoms of STIs, thus the true incidence of STIs is certainly higher than the reported one. Assumptions used in the quantification relating to incidence of STIs on a national level and incidence of individual syndromes were developed in consultation with MOH/STD Control Programme Managers.

Implementation of STI services was at its peak during the five years of the World Bank STI project (1995–2000). There were relatively consistent levels of drugs available during the same period. In addition to the World Bank, drugs were also provided by DfID and KfW. However, during the period between December 2000 (when the project ended) and June 2002, when the new supply of STI drugs through the World Bank MAP project is expected to arrive, drug supply for STI treatment has been sporadic or non-existent in public sector sites.

## Assumptions

1. For this quantification, a consumption- and logistics-based forecast was not conducted, because there have been prolonged shortages and stockouts of STI drugs in the public sector, at the national level, since the World Bank STI project ended in 2000. Some sales/issues data exists from Joint Medical Stores, the primary supplier of the NGO sector. However, the data is not reliable enough to conduct a logistics-based forecast, because the JMS supply is highly dependent on what is available in the NMS pipeline, and JMS' sales fluctuate accordingly. Thus, when NMS has high stock levels, JMS sales are low, and vice versa.
2. NMS stock levels of any of the STI products are almost depleted. Although JMS has some items in stock, current stock levels for the purposes of quantification were assumed to be zero, because it was impossible to determine the proportion of JMS stock that was used for STI versus other purposes.
3. JMS also has some quantities on order, but, for the same reason, these were not included in the quantities on order in the quantification. The quantities that have been included in the quantification are those expected to arrive as part of the emergency shipment in June 2002 under the World Bank MAP project, as well as quantities expected to arrive in January 2003.
4. During the course of the World Bank STI project, the STD/ACP program conducted extensive training of health workers at all levels (down to HC2) in STI syndromic management. Also, ongoing training of

health workers in STI syndromic management is included in district training plans. For the purpose of quantification, it is assumed that service capacity to treat all patients in STI syndromic management exists, and additional training is not needed before service providers can provide treatment. Dissemination and training of service providers in the new guidelines will be done through ongoing district training efforts.

5. Population data was gathered from the 2000/2001 DHS. The rate of natural increase in the population is low (2.7 percent); so no adjustment was made for 2003 population figures.
6. There is no current data on national prevalence of STIs among men or women. In women, prevalence was assumed to be 2 percent. This is believed to be a low estimate, but excludes asymptomatic infections, which will not be captured by the national policy of STI treatment by syndromic management.
7. For males, although general prevalence is believed to be low, incidence is likely much higher, with an average of five repeat visits per STI case. The 2001 HIV/AIDS surveillance report showed the incidence of urethritis ranging from 7 percent to 1 percent. For the purposes of quantification, it was assumed that 2 percent of men suffered an STI episode in a 12-month period.
8. No current data on prevalence or incidence of STI syndromes among men or women exists. The prevalence of each syndrome used in the quantification was based on results from two facility-based surveys in 1996 and 1998 and the combined experience of program managers at the MOH STD control unit and CDC. Although normal vaginal discharge (candidiasis) is not an STI, quantification of drugs for its treatment was included because, at the service level, there is little differentiation between abnormal and normal vaginal discharge.
9. Drugs to treat “other” conditions apart from the four major STI syndromes for both males and females were not included in the quantification and should be addressed in subsequent visits. Similarly, drugs to treat STIs in children were not included as part of the quantification.
10. According to the DHS, 54.4 percent of women and 64.3 percent of men who had an STI sought treatment at a clinic or hospital. For women, because they have well-established relationships with public sector health units and because, in general, they cannot afford private services, the majority were assumed to attend public sector or NGO sites. In contrast, it was assumed that only half those men went to public or NGO sites, and the rest sought care at private facilities.
11. According to the DHS, 13 percent of women were pregnant at the time of the survey. In community-based surveys carried out by the MOH, 17 percent were found to be pregnant. For the purposes of quantification, a 15 percent pregnancy rate was used.
12. Although an ideal programmatic goal is to achieve universal treatment of partners, currently it is assumed that 35 percent of all partners of clients treated for a syndrome go to either a public or NGO site to be treated.
13. Because all the drugs are being bought under WB/MAP funding, procurement will be done by the MOH, in accordance with its new procurement procedures. Only the emergency shipment and the January 2003 order will be procured under WB/MAP. Thus a lead time of nine months was assumed. Buffer stock was assigned at 4.5 months (or half the lead time).
14. For the projections for 2003–2004 no lead time was factored in, because this had already been accounted for during the 2002–2003 quantification, and the assumption was the forecasting was done with enough notice to allow for the planned procurement to arrive on time. A buffer stock of 4.5 months was built into

the projection. Because of the uncertainties around consumption rates, it was assumed that the buffer stock was depleted by the time the 2003–2004 shipments arrive in country, and thus the stock on hand for most products would be zero at that time. Although this is not the norm in forecasting, it was done deliberately to account for lack of data on consumption and possible delays in procurement. However, for drugs that were over ordered in 2002–2003 (benzathine penicillin, doxycycline, and erythromycin), stock on hand was taken at the quantity that was over-supplied. The only exception was for cotrimoxazole. It was assumed there would be 50 percent leakage into other uses of the drug, and stock on hand was taken at half of the over-supplied quantity.

The following tables summarize the data used to determine prevalence or incidence of each syndrome (see appendix C for details of treatment by syndrome and logistics adjustments):

**Table 1: Estimates for Number of Women Treated for STIs**

Total population for 2001	21,563,446	A
Total number of women (A x 52%)	11,212,992	B
Number of women in reproductive age 15–49 (B x 40.1%)	4,496,410	C
Estimated prevalence of STIs in women (C x 25%)	1,124,102	D
Estimated number of STI cases treated syndromically in public sector health facilities (D x 25%)	562,051	E
Percentage and number of STI cases by syndrome		F
Abnormal vaginal discharge syndrome (E x 48%)	269,784	F1
Abdominal pain (E x 29%)	162,995	F2
Genital ulcer (E x 18%)	101,169	F3
Others (5%)	28,102	F4

**Table 2: Estimates for Number of Men Treated for STIs**

Total population for 2001	21,563,446	A
Total number of men (A x 48%)	10,350,454	B
Number of men aged 15–49 (B x 40.1%)	4,150,532	C
Estimated proportion of men suffering an STI episode in 12 months (C x 20%)	830,106	D
Estimated number of STI cases treated syndromically in public sector health facilities (D x 30%)	83,011	E
Percentage and number of STI cases by syndrome		F
Genital ulcer syndrome (E x 60%)	66,409	F1
Urethral discharge syndrome (E x 30%)	16,602	F2
Other (E x 10%)	24,903	F3

**Table 3: Estimates for Pregnant Women Treated for Syphilis**

Total population for 2001	21,563,446	A
Total number of women (A x 52%)	11,212,992	B
Number of women in reproductive age 15–49 (B x 40.1%)	4,496,410	C
Number of women pregnant in a year (C x 15%)	674,462	D
Number of women that attend at least one ANC visit (D x 95%)	640,738	E
Number of women that receive screening for syphilis (50% of sites in the country, E x 50%)	320,369	F
Prevalence of syphilis among pregnant women (F x 8%)	25,630	G

Based on the number of cases of men and women treated for STIs identified in tables 1–3 above, table 4 presents the quantities of drugs required for STI treatment between May 2002 and April 2003 that still must be ordered after both the emergency and regular procurement shipments from MAP arrive. As mentioned previously, quantities required were estimated based on the recently revised guidelines presented in appendix B. Details on the conversion from number of cases to quantities of drugs can be found in appendix C, table 6.

**Table 4: Quantities of STI Drugs Still Required between May 2002–April 2003<sup>1</sup> for Syndromic Management in Public and NGO Sectors**

Drug Name, Dosage, Form	Quantity Required	Quantity on Order <sup>§</sup>	Quantity to Order <sup>f</sup>
Benzathine penicillin dry powder for injection	309,466	2,000,000	0
Ciprofloxacin 500 mg tablet	5,208,380	1,500,000	3,708,380
Doxycycline 100 mg tablet	16,222,025	18,750,000	0
Metronidazole 200 mg tablet	19,747,271	18,750,000	997,271
Cotrimoxazole 400/80 mg tablet	2,708,810	20,000,000	0
Erythromycin 250 mg tablet	8,845,715	10,000,000	0
Nystatin 100,000 I.U. pessary	20,057,199	7,200,000	12,857,199
Acyclovir 200mg tablet	16,409,069	312,500	16,096,569
Water for Injection 10 ml	309,466	0	309,466
Rapid Plasma Reagin (RPR) Syphilis Antigen Test	714,819	400,000	314,819
<b>Total Cost of Commodities to Order</b>			<b>U.S.\$3.8 mil.</b>

\* Quantities on Order include emergency shipments for May/June 2002 and planned shipments under ongoing tender, expected in early 2003. Only World Bank/MAP shipments have been included.

φ Quantity to Order sufficient to fulfill 12 months of projected demand plus 9 months lead time and 4.5 months buffer stock. Quantity to order is given in individual units not in pack sizes

Using approximate costs provided by the World Bank, the quantities to order listed in table 4 will cost about U.S.\$ 3.8 million (see appendix C, table 8). These are quantities of STI drugs required over and above the procurements already conducted under MAP. Although cefixime was included in the quantification, because the quantities to order are few and there are no clear guidelines about the level where cefixime would be used, the drug was omitted from the above summary table.

It is interesting to note that—primarily due to changes in the syndromic management protocols—significant quantities of benzathine penicillin (1.7 million vials), doxycycline (2.5 million tablets), and cotrimoxazole (17.3 million tablets) will not be needed by the STI program. In practice, however, it will take time for the changes in the treatment practices to be disseminated and implemented at lower levels. Thus, changes in prescribing patterns will not be immediate, and it is likely, in fact, that many of the drugs will be used, if not by the STI program, then for OI prevention and treatment or other purposes.

Table 4 does not include quantities of all the consumable supplies or equipment required for STI syndromic management and screening and treatment of pregnant women for syphilis. Including these, the cost for commodities is about U.S.\$4.1 million (see appendix C, table 8).

The quantities listed in table 4 should be procured immediately to reduce the possibility of a stockout of STI drugs.

<sup>1</sup> This is the sum of quantities required to meet the projected demand (as calculated by the methodology documented in this report) and fill the pipeline, because there are no stocks at present.

An estimate for quantities of STI drugs required from May 2003 to April 2004 was also conducted, primarily to provide STI program managers with a ballpark estimate of their commodity needs for the following year, thus allowing for forward planning in resource allocation. The quantification was based on the same assumptions as the one for 2002–2003, and these are likely to be quite different in practice. Although the dollar figure is useful for forward budget allocations, the actual quantities of each drug required are likely to change and careful re-examination of the assumptions and figures should precede any procurement decisions. The details of quantities and costs of STI drug estimates for 2003–2004 are listed in table 5.

**Table 5: Estimated Quantities of STI Drugs Required between May 2003–April 2004 for Syndromic Management in Public and NGO Sectors**

Drug Name, Dosage, Form	Quantity Required	Stock on Hand <sup>§</sup>	Quantity to Order <sup>φ</sup>
Benzathine Penicillin dry powder for Injection	200,244	1,690,534	0
Ciprofloxacin 500 mg tablet	3,370,125	0	3,370,125
Doxycycline 100 mg tablet	10,496,607	2,527,975	7,968,632
Metronidazole 200 mg tablet	12,777,650	0	12,777,650
Cotrimoxazole 400/80 mg tablet	1,752,762	8,645,595	0
Erythromycin 250 mg tablet	5,723,702	1,154,285	7,284,706
Nystatin 100,000 I.U. pessary	12,978,191	0	4,569,417
Acyclovir 200 mg tablet	10,617,635	0	10,617,635
Water for Injection 10 ml	200,244	0	200,244
Rapid Plasma Reagin (RPR) Syphilis Antigen Test	462,528	0	462,528
<b>Total Cost Of Commodities To Order</b>			<b>U.S.\$10.2 mil</b>

♣ Stock on Hand is assumed to be zero except where quantities oversupplied previous year. No further shipments are included, because early 2003 shipments are included in previous estimate.

φ Quantity to Order sufficient to fulfill 12 months of projected demand plus 4.5 months buffer stock. Quantity to order is given in individual units not pack sizes.

Using the same prices as for 2002–2003 and the same exchange rate, the full years estimate of STI drugs will cost about U.S.\$10.2 million (see appendix C, table 10). Including consumables, the total cost is about U.S.\$10.5 million.





# Recommendations

The following combination of short- and medium-term recommendations will ensure that time-sensitive actions and long-term strategic approaches with significant implications for commodity availability and logistics functions can be taken and/or begun. It is anticipated that the recommendations will be implemented collectively by the STD/ACP Programme and relevant partners internal and external to the MOH working in each programmatic area.

## General Recommendations

**Recommendation 1** (mid- to long-term). Continue advocating for the urgent need to recruit a senior logistics officer to work within the expanded pharmacy department. Although the DELIVER resident advisor will continue to work with the pharmacy department team in implementing logistics system improvement activities, it is important that the team include logistics management skills so capacity building within the MOH in the area of supply chain management is possible.

**Recommendation 2** (mid-term). Explore the possibility of developing an action plan between all the units in the MOH and NMS to concretely determine the timeframe for integrating selected logistics management functions and obtain commitments to move the plan forward.

**Recommendation 3** (short-term). Identify possible study tours for NMS and other appropriate commodity managers to visit neighbouring countries and to benefit from lessons learned in integration, decentralization, and reform of the national medical stores.

**Recommendation 4** (mid-term). Expedite the development and maintenance of a central commodity database to track all MOH and donor inputs for essential health commodity supplies. This information has been, and is likely to continue to be, crucial in alerting commodity management donors and stakeholders about impending stockouts or shortages in various product categories.

## STI Program

### Quantification

Due to the lack of hard data, the quantification of STI drugs required is based on a series of generally liberal assumptions developed with ACP/STI program staff about prevalence and incidence rates of the various syndromes. By using these liberal assumptions, the quantities required are much more likely to be overstated than understated. However, because there is significant overlap between the drugs quantified for the purposes of STI syndromic management and other uses of these same drugs, tracking the accuracy of the quantification will be difficult and stockouts of some items might still be possible.

**Recommendation 5** (short-term). Validate projections with STD/ACP program staff. Given that projections are primarily based on assumptions rather than data, they should be used as a starting point for thoughtful discussion prior to making concrete purchasing decisions.

**Recommendation 6** (mid-term). During subsequent visits, ensure that quantities for “other” STI diagnoses are quantified and included in the overall needs estimates for STI drugs.

## Procurement and Financing

Financing sources for STI drugs are fragmented between MAP and GFATM expected funds. The procurement mechanism for GFATM has not been selected. Regardless of the selected options, the product must be received promptly and steps taken to prevent delays due to awards given to unregistered product manufacturers.

**Recommendation 7** (short-term). Begin to identify funding sources for the U.S.\$3.8 million needed to supply sufficient drugs to meet demand for STI services projected in table 4, if funds from the GFATM are insufficient. Advocate for MAP or GFATM funds to be allocated toward continued supply of STI drugs in 2003–2004, if possible through the HSSP budget line for essential drugs (see table 5).

**Recommendation 8** (short-term). Ensure that product specifications are consistent with STD/ACP program requirements and the assumptions in the methodology.

**Recommendation 9** (mid- to long-term). MOH, UAC, WB, and NDA staff to communicate regularly on shipment status of awarded tenders to ensure that potential delays of incoming commodities, whether through delayed registration or other causes, are identified early enough for timely resolution.

## Distribution

**Recommendation 10** (short-term). Develop a distribution plan for incoming STI drugs with the STD/ACP unit and pharmacy unit. Develop a mechanism for distributing STI drugs to ensure appropriate drug provision by health unit level and to ensure distribution that reflects the geographic treatment patterns of STIs.

**Recommendation 11** (mid- to long-term). As a first step toward integrating the supply, financing, and purchasing of STI drugs into the essential drug system, help districts quantify their needs, and continue to advocate for including STI drugs in the MOH/Pharmacy and UHSSP transition from a push to pull system, beginning in January 2003.

## Information Systems

**Recommendation 12** (short-term). Although consumption of all STI drugs should be closely monitored to validate assumptions made for the quantification and to help with future forecasts, particular attention should be paid to consumption of erythromycin. If prescribing practices do not change soon, as stated in the assumptions, more quantities of erythromycin may need to be ordered.

**Recommendation 13** (mid- to long-term). Strengthen STI sentinel site reporting to increase data availability for quantification and other program management interventions.

**Recommendation 14** (mid- to long-term). Begin to think about including STI drugs in the district quantification plan for other essential drugs to ensure a long-term logistics management information system data available on the actual consumption of these products.

**Recommendation 15** (mid- to long-term). Ideally, development of a centralized LMIS would provide the most accurate and timely logistics data for use in subsequent forecasting exercises, as well as help in day-to-day management of STI and other drugs. However, this system would be extremely expensive and use valuable time and resources to implement, and would not have the support of key stakeholders because it is not consistent with strategies outlined in MOH/Uganda's Health Sector Strategic Plan. It's possible to integrate STI drugs into the district drug financing mechanism, collect quality issues data from NMS; validate the quantities with survey teams during forecasting or quantification exercises.

## **Appendix A**

# **People Contacted**



## People Contacted

Name	Organization	Telephone
Dr. Charles Hitimana-Lukanika	Executive Director, AIDS Information Centre	077 420900
Mr. Tephy Mujurizi	Laboratory Technologist, AIC	077 495547
Mrs. Josephine Kalule	Program Manager, AIC	077 412373
Maurice Adams	Director, AIM	077 765432
Rebekah Mkasa	PMTCT Coordinator, AIC	077 495547
Dr. Paul Waibale	Assistant Director, AIM	077 502243
Dr. Robert Downing	CDC/UVRI	075 788222
Dr. Rebecca Bunnel	CDC/Uganda	075 751019
Dr. Donna Kabatesi	CDC/Uganda	075 751029
Dr. Jonathon Mermin	CDC/Uganda	075 759305
Ms. Caroline Healey	Crown Agents	
Dr. Andrew Namonyo	DDHS, Pallisa District	<a href="mailto:nnamonyo@yahoo.com">nnamonyo@yahoo.com</a>
Chris Forshaw	Pharmaceutical Advisor, UHSSP	077 760176
	District, Drug Management Advisor, UHSSP	
Hanif Nazerali	JMS	077 771772
Wim Mensink	Malaria Resource Centre	075 766400
Graham Root	Nakasero Blood Transfusion Unit	077 744038
Dr. Kataha	Infection Control, MOH	077 431880
Ms Teddy Lukinda	Malaria Program, MOH	041 340874
Dr. Kato	Chief Pharmacist, MOH	077 415697
Martin Oteba	RH, MOH	077 512975
Dr. Florence Ebanyat	STD/ACP, MOH	041 340874
Dr. Zainab Akol	STD/ACP, MOH	077 451008
Dr. Fred Kambugu	STD/ACP, MOH	077 588285
Mrs. Vastha Kibirige	STD/ACP, MOH	077 565100
Dr. Wilford Kirungi	STD/ACP, MOH	077 434139
Dr. Elizabeth Madraa	STD/ACP, MOH	077 695109
Dr. Joshua Musinguzi	STD/ACP, MOH	077 611135
Dr. Saul Onyango	STD/ACP, MOH	077 508669
Charles Ssebatwale	STD/ACP, MOH	077 437662
Dr. Francis Adatu	TB/Leprosy, MOH	077 501988
Saul Kidde	NMS	077 771337
Dr. Susan Mukasa	PMTCT Advisor, PSI/CMS	077 503597
John Kokas Omiat	Procurement Officer, UACP/UAC	077 377346
Suzanne McQueen	USAID PHN Officer	077 200529
Elise Ayers	USAID	041 235879
Dr. Benon Biryahwaho	Chief Virologist, UVRI	071 200234
Mr. K. Walusaga	Medical Microbiologist, UVRI	077 517197
Ms. Musarait Kashmiri	Chief Operating Officer, VR Promotions	071 639904
Dr. Joseph Imoko	WHO/TB Medical Officer	
Giuliano Gargioni	WHO Advisor to TB	077 401191
	WHO Health Sector Policy Planning and Management	
Dr. Humphrey Karamagi	WHO Professional Officer	077 431371
Joseph Serutoke		077 771339



## **Appendix B**

# **Treatment Algorithms for the Major STD Syndromes**

The following algorithms were reproduced from the yellow wall chart developed by the STD Control Unit, STD/ACP, and MOH, and adjusted, based on conversations with program managers. Publication of revised algorithms is expected in October 2002. This reproduction is only to facilitate understanding of the quantification methodology and does not capture all details of the revised algorithms.

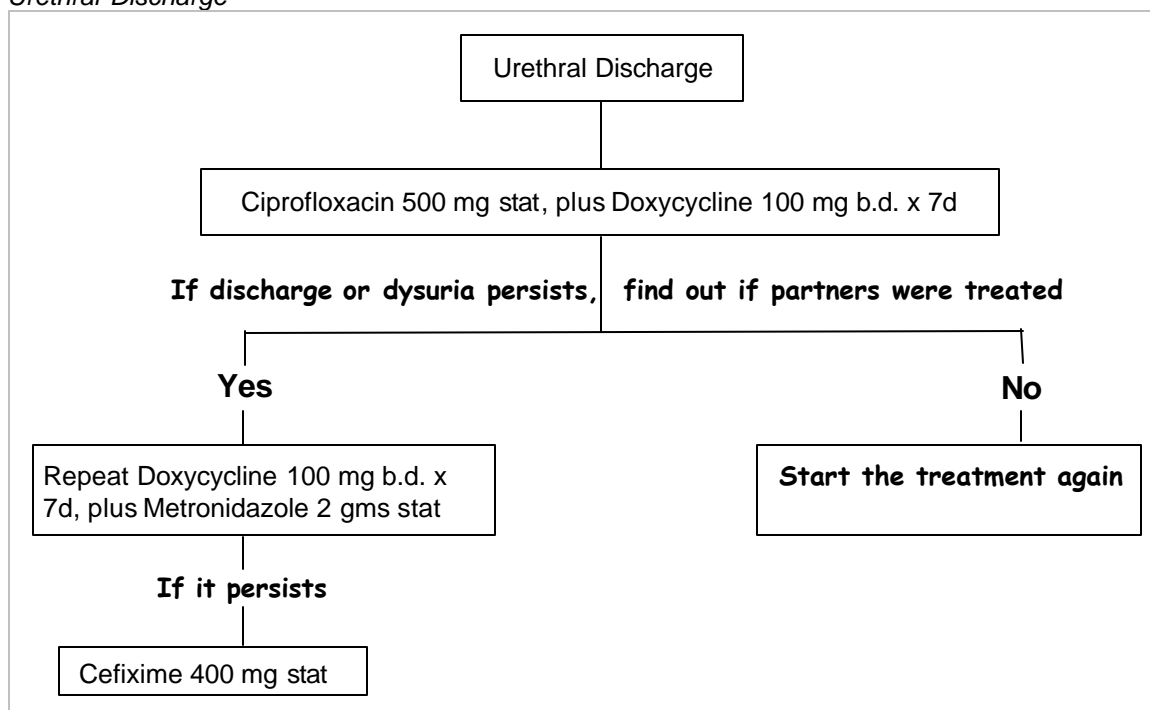




## Treatment Algorithms for the Major STD Syndromes

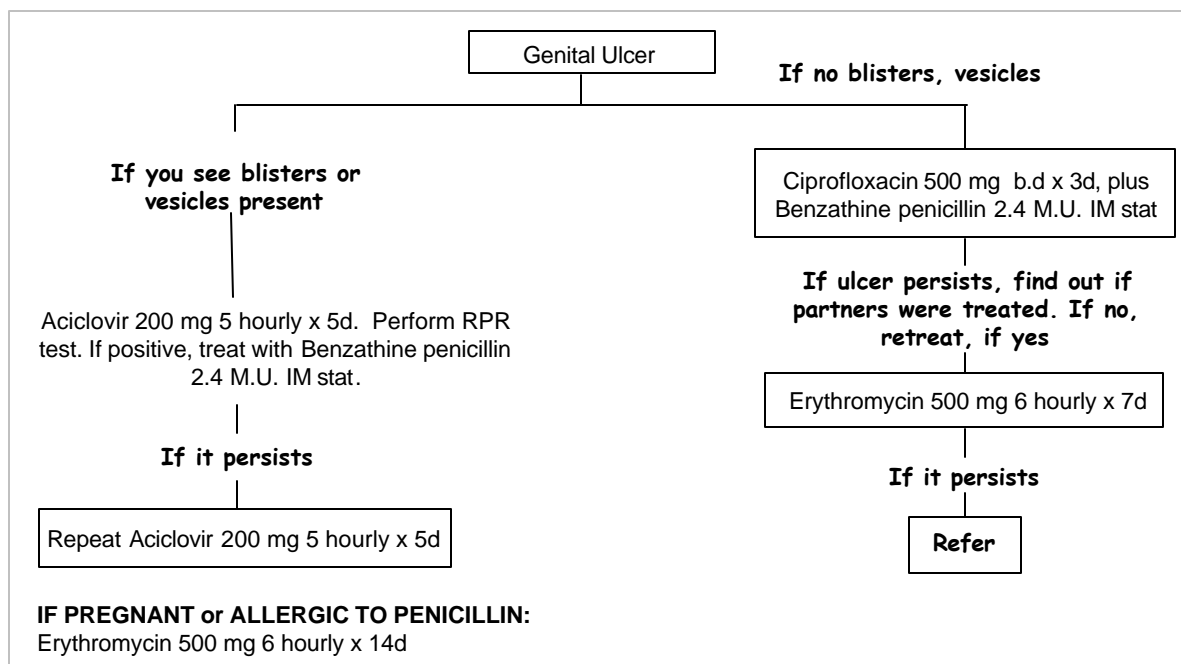
### Code 1:

#### Urethral Discharge



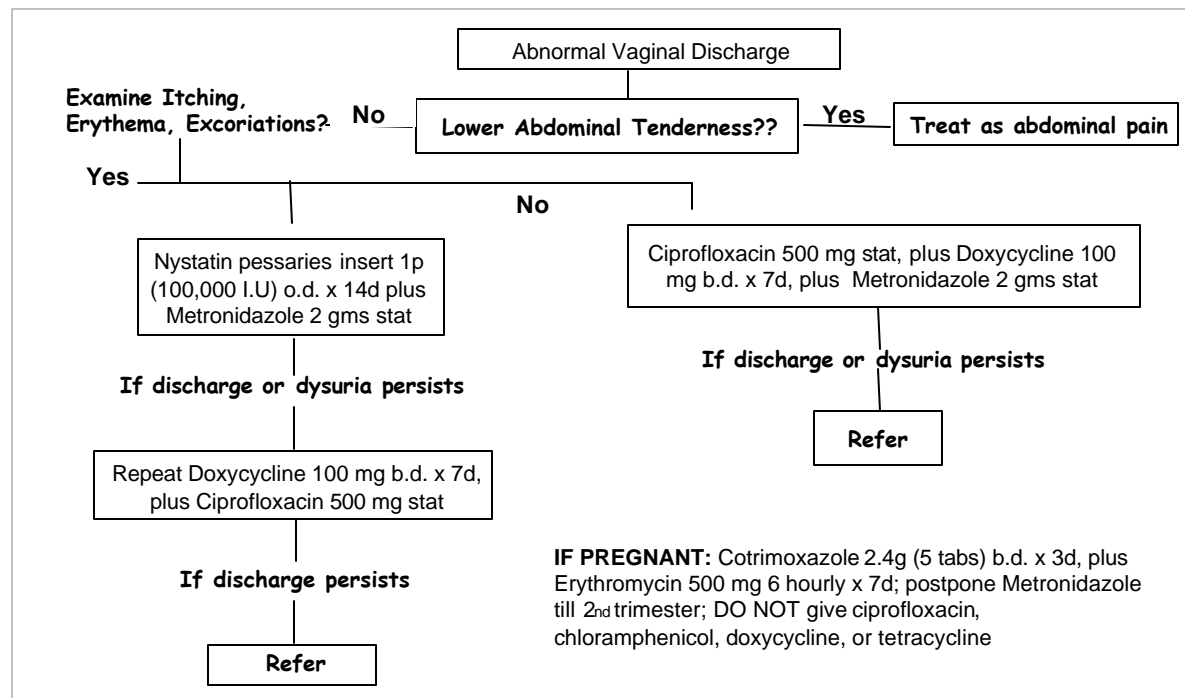
### Code 2:

#### Genital Ulcer



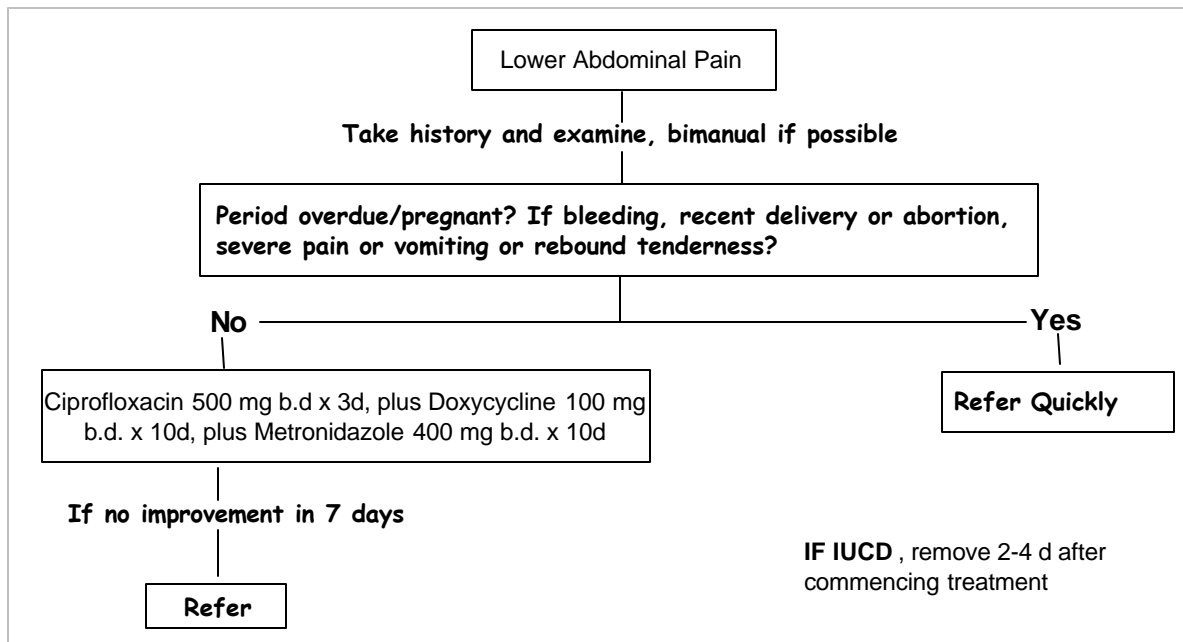
**Code 3:**

*Abnormal Vaginal Discharge*



**Code 4:**

*Lower Abdominal Pain*



## **Appendix C**

# **Methodology for Quantifying STI Drugs for Syndromic Management**



TABLE 6: Estimated Requirements for STI Drugs for Uganda May 2002 - April 2003

DIAGNOSIS		Year 2002 Estimated Number Episodes	Year 2003 Projected Number Episodes <sup>(c)</sup>	No. of Visit	Drug Product	Basic Unit	Basic Unit per Dose	No. Doses per Day	No. of Days	Basic Units per Episode	Total Basic Units Needed
Female STI syndrome		562,051	562,051								
1.0 Vaginal Discharge Syndrome (VDS) 48%		269,784	269,784								
1.1 Pregnant	15% Treated	40,468	40,468	1st	1. Cotrimoxazole 2.4g (5 tabs 400/80mg) b.d. x 3d 2. Erythromycin 500 mg, (250mg tabs x 2) 6 hrly x	Tablet Tablet	5 2	2 4	3 7	30 56	1,214,030 2,266,190
1.2 Non-Pregnant	85% Treated	229,317	229,317	1st							
Candidiasis	80%	183,453	183,453		1. Nystatin pessary 100,000 I.U o.d x 14d 2. Metronidazole 2g stat (200mg tabs x 10)	Pessary Tablet	1 10	1 1	14 1	14 10	2,568,348 1,834,534
	50% with 5 incidents per year of candidiasis	91,727	91,727		3. Nystatin pessary 100,000 I.U o.d x 14d	Pessary	1	1	14	14	6,420,871
	15% Revisit	27,518	27,518	2nd							
	100%	27,518	27,518		1. Doxycycline 100 mg b.d. x 7 days 2. Ciprofloxacin 500mg stat	Tablet Tablet	1 1	2 1	7 1	14 1	385,252 27,518
1.3 Non-Preg.	85% Treated	229,317	229,317								
Gon/Chlam	20%	45,863	45,863	1st	1. Ciprofloxacin 500mg stat	Tablet	1	1	1	1	45,863
	20%	45,863	45,863		2. Doxycycline 100mg b.d. x 7d	Tablet	1	2	7	14	642,087
	20%	45,863	45,863		3. Metronidazole 2g stat (200mg tabs x 10)	Tablet	10	1	1	10	458,634



TABLE 6: Estimated Requirements for STI Drugs for Uganda May 2002 - April 2003

DIAGNOSIS	Year 2002 Estimated Number Episodes	Year 2003 Projected Number Episodes <sup>(c)</sup>	No. of Visit	Drug Product	Basic Unit	Basic Unit per Dose	No. Doses per Day	No. of Days	Basic Units per Episode	Total Basic Units Needed
Male STI syndrome	249,031	249,031								
2.0 Urethral Discharge Syndrome (UDS) 30% male	74,709	74,709								
100% Treated	74,709	74,709	1st							
100%	74,709	74,709		1. Ciprofloxacin 500mg stat	Tablets	1	1	1	1	74,709
100%	74,709	74,709		2. Doxycycline 100 mg b.d. x 7 days	Tablet	1	2	7	14	1,045,930
5% Revisit	3,735	3,735	2nd							
100%	3,735	3,735		1. Doxycycline 100 mg b.d. x 7 days	Tablet	1	2	7	14	52,297
100%	3,735	3,735		2. Metronidazole 2 g stat (200mg tabs x 10)	Tablet	10	1	1	10	37,355
1% Revisit	37	37	3rd	1. Cefixime 400 mg (200mg tabs x 2) stat	Tablet	2	1	1	2	75

DIAGNOSIS	Year 2002 Estimated Number Episodes	Year 2003 Projected Number Episodes <sup>(c)</sup>	No. of Visit	Drug Product	Basic Unit	Basic Unit per Dose	No. Doses per Day	No. of Days	Basic Units per Episode	Total Basic Units Needed
Female STI syndrome	562,051	562,051								
3.0 Lower Abdominal Pain (LAP) 29%	162,995	162,995								
100% Non-Pregnant	162,995	162,995	1st							
100%	162,995	162,995		1. Ciprofloxacin 500mg b.d. x 3d	Tablets	1	2	3	6	977,969
100%	162,995	162,995		2. Doxycycline 100 mg b.d. x 10 days	Tablet	1	2	10	20	3,259,896
100%	162,995	162,995		3. Metronidazole 400 mg (200mg x 2 tabs) b.d. x 10	Tablet	2	2	10	40	6,519,792

TABLE 6: Estimated Requirements for STI Drugs for UGANDA May 2002 - April 2003

DIAGNOSIS	Year 2002 Estimated Number Episodes	Year 2003 Projected Number Episodes <sup>(c)</sup>	No. of Visit	Drug Product	Basic Unit	Basic Unit per Dose	No. Doses per Day	No. of Days	Basic Units per Episode	Total Basic Units Needed
Female STI syndrome	562,051	562,051								
4.0 Genital Ulcer Females (GUS) 18%	101,169	101,169								
4.1 70% blister (susp. Herpes)	70,818	70,818								
100%	70,818	70,818	1st	1. Aciclovir 200mg 5 hourly x 5d	Tablet	1	5	5	25	1,770,461
20% revisit	14,164	14,164	2nd	1. Aciclovir 200mg 5 hourly x 5d	Tablet	1	5	5	25	354,092
4.2 30% ulcer susp. Syphilis)	30,351	30,351	1st							
16% allergy and pregnant	4,856	4,856		1. Erythromycin 500 mg (250mg tabs x 2) 6 hrly x 14d	Tablet	2	4	14	112	543,886
85% Non Pregnant	25,798	25,798	1st							
100%	25,798	25,798		1. Ciprofloxacin 500 mg b.d x 3d	Tablet	1	2	3	6	154,789
				PLUS						
100%	25,798	25,798		2. Benzathine penicillin 2.4 M.U stat	Vial	1	1	1	1	25,798
				3. Water for Injection, 10 ml	Vial	1	1	1	1	25,798
				4. Syringe 10 ml and 21 Gauge needle	Syringe/Needle	1	1	1	1	25,798
20% revisit 4.2	5,160	5,160	2nd	1. Erythromycin 500 mg (250mg tabs x 2) 6 hrly x 7d	Tablet	2	4	7	56	288,939



TABLE 6: Estimated Requirements for STI Drugs for Uganda May 2002 - April 2003

DIAGNOSIS	Year 2002 Estimated Number Episodes	Year 2003 Projected Number Episodes <sup>(c)</sup>	No. of Visit	Drug Product	Basic Unit	Basic Unit per Dose	No. Doses per Day	No. of Days	Basic Units per Episode	Total Basic Units Needed
Male STI syndrome	249,031	249,031								
5.0 Genital Ulcer Male (GUS) 60%										
5.1 70% blisters (susp. Herpes)	174,322	174,322								
100%	174,322	174,322	1st	1. Aciclovir 200mg 5 hourly x 5d	Tablet	1	5	5	25	4,358,043
20% revisit	34,864	34,864	2nd	1. Aciclovir 200mg 5 hourly x 5d	Tablet	1	5	5	25	871,609
5.2 30% ulcer susp. Syphilis)	74,709	74,709	1st							
100%	74,709	74,709		1. Ciprofloxacin 500 mg b.d. x 3d PLUS	Tablet	1	2	3	6	448,256
100%	74,709	74,709		2. Benzathine penicillin 2.4 M.U stat	Vial	1	1	1	1	74,709
				3. Water for Injection, 10 ml	Vial	1	1	1	1	74,709
				4. Syringe 10 ml and 21 Gauge needle	Syringe/Needle	1	1	1	1	74,709
20% revisit 5.2 + penicillin allergy	14,942	14,942	2nd	1. Erythromycin 500mg (250mg tabs x 2) 6 hrly x 7d	Tablet	2	4	7	56	836,744

Uganda: Estimation of Commodity Requirements for 2002–2004. Drugs to Treat STI

TABLE 6: Estimated Requirements for STI Drugs for Uganda May 2002 - April 2003

DIAGNOSIS	Estimated Number Episodes	Projected Number Episodes	No. of Visit	Drug Product/Item	Basic Unit	Basic Unit per Dose	No. Doses per Day	No. of Days	Basic Units per Episode	Total Basic Units Needed
Estimated No. Pregnant Women Screened <sup>(e)</sup>	320,369	320,369		Rapid Plasma Reagin (RPR) Syphilis Antigen Test	Slide	1	1	1	1	320,369
Syphilis Prevalence 8% (+ Reactive RPR)	25,630	25,630								
100% Treated	25,630	25,630								
99%	25,373	25,373		1. Benzathine Benzylpenicillin dry powder for Injection, 2.4 MU I.M. stat	Vial	1	1	1	1	25,373
	25,373	25,373		2. Water for Injection, 10 ml	Vial	1	1	1	1	25,373
	25,373	25,373		3. Syringe 10 ml and 21 Gauge needle	Syringe/Needle	1	1	1	1	25,373
50% Partners txtd	12,815	12,815		1. Benzathine Benzylpenicillin dry powder for Injection, 2.4 MU I.M. stat	Vial	1	1	1	1	12,815
				2. Water for Injection, 10 ml	Vial	1	1	1	1	12,815
				3. Syringe 10 ml and 21 Gauge needle	Syringe/Needle	1	1	1	1	12,815
1% Penicillin Allergy	256	256		1. Erythromycin 500mg (250mg x 2tabs) 6 hrly x 14 d	Tablet	2	4	14	112	28,705

(a) Year 2001 Estimated Number of Episodes estimated by MOH STD/ACP

(b) Year 2002 = May 2002 - April 2003

(c) Year 2002 Projected Number of Episodes are Population Based estimates

TABLE 7: Quantity to Order: STI Drugs, Laboratory Tests and Reagents, Expendable Medical Supplies UGANDA May 2002- April 2003

Drug Product	QR	Adjusted QR	Adjusted QR	AMQR	AMQR X LT	1.5 X LT	SoH + Q on Order	QO
	Total Basic Units Needed	Adjust for Partner TX 35% (Cipro, Dox)	Adjust for Losses/Wastage 5%	Average Monthly Quantity Required	AMQR X Supplier Lead Time in Months <sup>1,2</sup>	Lead Time Plus Buffer Stock <sup>3</sup>	Stock on Hand and Quantity on Order	Quantity to Order [Total No. Basic Units]
Benzathine Penicillin dry powder for Injection	138,695	138,695	145,630	12,136	109,224	163,836	2,000,000	-1,690,534
Ciprofloxacin 500 mg tablet	1,729,104	2,334,290	2,451,005	204,250	1,838,250	2,757,375	1,500,000	3,708,380
Doxycycline 100 mg tablet	5,385,462	7,270,373	7,633,892	636,158	5,725,422	8,588,133	18,750,000	-2,527,975
Metronidazole 200 mg tablet	8,850,314	8,850,314	9,292,830	774,403	6,969,627	10,454,441	18,750,000	997,271
Cefixime 200 mg tablet	75	75	78	7	63	95	0	173
Cotrimoxazole 400/80 mg tablet	1,214,030	1,214,030	1,274,732	106,228	956,052	1,434,078	20,000,000	-17,291,190
Erythromycin 250 mg tablet	3,964,464	3,964,464	4,162,687	346,891	3,122,019	4,683,029	10,000,000	-1,154,285
Nystatin 100,000 I.U. pessary	8,989,219	8,989,219	9,438,680	786,557	7,079,013	10,618,520	7,200,000	12,857,199
Aciclovir 200mg tablet	7,354,204	7,354,204	7,721,914	643,493	5,791,437	8,687,156	312,500	16,096,569
Water for Injection 10 ml	138,695	138,695	145,630	12,136	109,224	163,836	0	309,466
<b>Laboratory Tests and Reagents</b>								
Rapid Plasma Reagin (RPR) Syphilis Antigen Test	320,369		336,387	28,032	252,288	378,432	400,000	314,819
<b>Expendable Medical Supplies</b>								
Vacutainer Tubes and Needles - 10 ml (for blood draw for RPR)	320,369		336,387	28,032	252,288	378,432	200,000	514,819
10 ml Syringes and 21 Gauge Needles packed together	138,695		145,630	12,136	109,224	163,836	200,000	109,466
Gloves, Examination Latex Disposable/Non-Sterile 6/8	565,726		594,012	49,501	445,509	668,264	50,000	1,212,275
Gloves, Examination Latex Disposable/Non-Sterile 9/10	565,726		594,012	49,501	445,509	668,264	50,000	1,212,275
Cotton Wool Absorbent Swabs (7.5cm X 7.5cm, 9cm Pk)	250,000		262,500	21,875	196,875	295,313	0	557,813
Gauze hospital quality (9 X 8 mesh, 90/91cm width X 100mt length)	3,000		3,150	263	2,367	3,551	0	6,701
<b>Equipment</b>								
Speculum (stainless steel) for health facilities missed [MED]	1,000		0	0	0	0	0	1,000
Speculum (stainless steel) for health facilities missed [LG]	1,000		0	0	0	0	0	1,000
Forceps sponge-holding, straight (stainless steel)	1,000		0	0	0	0	0	300

<sup>1</sup> Lead Time = The time from preparation of the order, to approval, procurement, shipment to or within country, customs clearance, and time in central warehouse for reception, inspection, storage and packaging until ready for distribution.

<sup>2</sup> For the purposes of this quantification, Lead Time is assumed to be 9 months

<sup>3</sup> For the purposes of this quantification, Buffer Stock = 0.5 Lead Time, or 4.5 months

<sup>4</sup> Current Stock on Hand is assumed to be zero given reported shortages and stockouts. Therefore, additional quantities of product are required to cover Lead Time and Buffer Stock.

Uganda: Estimation of Commodity Requirements for 2002–2004. Drugs to Treat STI

**TABLE 8: Summary Cost Estimate for STI Drugs, Laboratory Tests and Reagents, Expendable Medical Supplies**  
**UGANDA May 2002 - April 2003**

No.	Drug Product	Strength	Basic Unit	Quantity to Order [Total No. Basic Units]	Pack Size	Quantity to Order [Rounded to Pack Size]	Basic Unit Cost (\$ U.S.)** NMS	Pack Size Cost (\$ U.S.)** NMS	TOTAL COST (\$ U.S.) NMS
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	Benzathine Penicillin dry powder for Injection	24 MU.	Vial	0	100	0		\$21.20	\$0
2	Ciprofloxacin 500 mg tablet	500mg	Tablet	3,708,380	100	37,084		\$3.60	\$133,502
3	Doxycycline 100 mg tablet	100mg	Tablet	0	1,000	0		\$10.60	\$0
4	Metronidazole 200 mg tablet	200mg	Tablet	997,271	1,000	997		\$2.55	\$2,542
5	Cefixime 200 mg tablet <sup>^</sup>	200mg	Tablet	173	100	2		\$4.10	\$8
6	Cotrimoxazole 400/80 mg tablet	400/80mg	Tablet	0	1000	0		\$6.70	\$0
7	Erythromycin 250 mg tablet	250mg	Tablet	0	1000	0		\$32.00	\$0
8	Nystatin 100,000 I.U. pessary	100,000 I.U.	Pessary	12,857,199	2800	4,592		\$58.50	\$268,632
9	Aciclovir 200mg tablet	200mg	Tablet	16,096,569	100	160,966		\$20.50	\$3,299,803
10	Water for Injection 10 ml	10ml	Ampoule	309,466	100	3,095		\$3.30	\$10,214
								<b>TOTAL</b>	<b>\$3,714,701</b>
									<b>\$3,714,693</b>
	Description of Item								
	minus cefixim								
<b>No.</b>	<b>Laboratory Tests and Reagents</b>								
12	Rapid Plasma Reagin (RPR) Syphilis Antigen Test (100/kit)		Slide	314,819	100	3,148		\$11.45	\$36,045
								<b>TOTAL</b>	<b>\$3,750,738</b>
<b>No.</b>	<b>Expendable Medical Supplies &amp; Equipment</b>								
13	Vacutainer Tubes and Needles - 10 ml (for blood draw for RPR)	10 ml	Tube/Needle	514,819	100	5,148		\$18.00	\$92,664
14	10 ml Syringes and 21 Gauge Needles packed together	10ml	Syringe/Needle	109,466	100	1,095		\$9.00	\$9,855
15	Gloves, Examination Latex Disposable/Non-Sterile 6/8	Medium	50 pc/box	1,212,275	50	24,246		\$4.50	\$109,107
16	Gloves, Examination Latex Disposable/Non-Sterile 9/10	Large	50 pc/box	1,212,275	50	24,246		\$4.50	\$109,107
17	Cotton Wool Absorbent swabs (500g)	500g	Box	557,813	100	5,578		\$1.72	\$9,607
18	Gauze pads sterile 10cm x 10cm	100	Box	6,701	100	67		\$7.33	\$491
19	Speculum (stainless steel) for health facilities missed [MED] <sup>^^</sup>	Medium	each	1,000	1	1,000	\$8.20		\$8,200
20	Speculum (stainless steel) for health facilities missed [LG] <sup>^^</sup>	Large	each	1,000	1	1,000	\$8.80		\$8,800
21	Forceps sponge-holding, straight (stainless steel) <sup>^^</sup>		each	300	1	300	\$7.20		\$2,160
								<b>TOTAL</b>	<b>\$349,991</b>
								<b>GRAND TOTAL</b>	<b>\$4,064,684</b>

\*\* Exchange Rate U.S.\$ 1.00 = 1800 Ushs. 4/2002

\*\* Actual WB contract prices not available, so total shipment cost divided by quantity used to estimate unit price, based on letter from UAC 27 August 2002

<sup>^</sup> Price for cefixime found in UNICEF May 2002 document on sources and prices of HIV/AIDS drugs

<sup>^^</sup> price from JMS Catalogue February 2002

TABLE 9: Quantity to Order: STI Drugs, Laboratory Tests, Reagents, Medical Supplies UGANDA May 2003- April 2004

Drug Product	QR	Adjusted QR	Adjusted QR	AMQR	AMQR X 4.5	Annual QR + BS	SoH + Q on Order	QO
	Total Basic Units Needed	Adjust for Partner TX 35% (Cipro, Dox)	Adjust for Losses/ Wastage 5%	Average Monthly Quantity Required	AMQR X 4.5 to get Buffer Stock 1,2	Annual QR Plus Buffer Stock	Stock on Hand and Quantity on Order 3	Quantity to Order [Total No. Basic Units]
Benzathine Penicillin dry powder for Injection	138,695	138,695	145,630	12,136	54,612	200,244	1,690,534	-1,490,290
Ciprofloxacin 500 mg tablet	1,729,104	2,334,290	2,451,005	204,250	919,125	3,370,125	0	3,370,125
Doxycycline 100 mg tablet	5,385,462	7,270,373	7,633,892	636,158	2,862,711	10,496,607	2,527,975	7,968,632
Metronidazole 200 mg tablet	8,850,314	8,850,314	9,292,830	774,403	3,484,814	12,777,650	0	12,777,650
Cefixime 200 mg tablet	75	75	78	7	32	116	0	116
Cotrimoxazole 400/80 mg tablet	1,214,030	1,214,030	1,274,732	106,228	478,026	1,752,762	8,645,595	-6,892,833
Erythromycin 250 mg tablet	3,964,464	3,964,464	4,162,687	346,891	1,561,010	5,723,702	1,154,285	4,569,417
Nystatin 100,000 I.U. pessary	8,989,219	8,989,219	9,438,680	786,557	3,539,507	12,978,191	0	12,978,191
Aciclovir 200mg tablet	7,354,204	7,354,204	7,721,914	643,493	2,895,719	10,617,635	0	10,617,635
Water for Injection 10 ml	138,695	138,695	145,630	12,136	54,612	200,244	0	200,244
<b>Laboratory Tests and Reagents</b>								
Rapid Plasma Reagin (RPR) Syphilis Antigen Test	320,369		336,387	28,032	126,144	462,528	0	462,528
<b>Expendable Medical Supplies</b>								
Vacutainer Tubes with Needles - 10 ml (for blood draw for RPR)	320,369		336,387	28,032	126,144	462,528	0	462,528
10 ml Syringes and 21 Gauge Needles packed together	138,695		145,630	12,136	54,612	200,244	0	200,244
Gloves, Examination Latex Disposable/Non-Sterile (LG)	565,726		594,012	49,501	222,755	816,767	0	816,767
Gloves, Examination Latex Disposable/Non-Sterile (MED)	565,726		594,012	49,501	222,755	816,767	0	816,767
Cotton Wool Absorbent Swabs (7.5cm X 7.5cm, 9cm Plv)	250,000		262,500	21,875	98,438	360,938	0	360,938
Gauze hospital quality (9 X 8 mesh, 90/91cm width X 100mt length)	3,000		3,150	263	1,184	4,340	0	4,340
<b>Equipment</b>								
Speculum (stainless steel) for health facilities missed [MED]	1,000		0	0	0	0	0	1,000
Speculum (stainless steel) for health facilities missed [LG]	1,000		0	0	0	0	0	1,000
Forceps sponge-holding, straight (stainless steel)	1,000		0	0	0	0	0	300

<sup>1</sup> Lead Time = no lead time assumed because this was factored into 2002-3 quantification

<sup>2</sup> For the purposes of this quantification, Buffer stock is assumed to be 4.5 months

<sup>3</sup> For the purposes of this quantification, SOH for most products assumed to be zero, except for those oversupplied during 2002-3 (BP, Doxycycline, Cotrimoxazole, Erythromycin) for which SOH is assumed to be the oversupplied quantity from previous year. Cotri was taken at 50% to account for other uses of the drug

Uganda: Estimation of Commodity Requirements for 2002–2004. Drugs to Treat STI

**TABLE 10: Summary Cost Estimate for STI Drugs, Laboratory Tests and Reagents, Expendable Medical Supplies**  
**UGANDA May 2003 - April 2004**

No.	Drug Product	Strength	Basic Unit	Quantity to Order [Total No. Basic Units] (c)	Unit Size (d)	Quantity to Order [Rounded to Unit Size] (e)	Basic Unit Cost (\$ U.S.)** NMS (f)	Unit Size Cost (\$ U.S.)** NMS (g)	TOTAL COST (\$ U.S.) NMS (h)
1	Benzathine Penicillin dry powder for Injection	2.4 MU.	Vial	0	100	0		\$21.20	\$0
2	Ciprofloxacin 500 mg tablet	500mg	Tablet	3,370,125	100	33,701		\$3.60	\$121,324
3	Doxycycline 100 mg tablet	100mg	Tablet	7,968,632	1,000	7,969		\$10.60	\$84,471
4	Metronidazole 200 mg tablet	200mg	Tablet	12,777,650	1,000	12,778		\$2.55	\$32,584
5	Cefixime 200 mg tablet^	200mg	Tablet	116	100	1		\$4.10	\$4
6	Cotrimoxazole 400/80 mg tablet	400/80mg	Tablet	0	1000	0		\$6.70	\$0
7	Erythromycin 250 mg tablet	250mg	Tablet	4,569,417	1000	4,569		\$32.00	\$146,208
8	Nystatin 100,000 I.U. pessary	100,000 I.U.	Pessary	12,978,191	100	129,782		\$58.50	\$7,592,247
9	Aciclovir 200mg tablet	200mg	Tablet	10,617,635	100	106,176		\$20.50	\$2,176,608
10	Water for Injection 10 ml	10ml	Ampoule	200,244	100	2,002		\$3.30	\$6,607
								<b>TOTAL</b>	<b>\$10,160,053</b>
								minus cefixime	<b>\$10,160,049</b>
<b>No.</b>	<b>Laboratory Tests and Reagents</b>								
12	Rapid Plasma Reagin (RPR) Syphilis Antigen Test (100/kit)		Slide	462,528	100	4,625		\$11.45	\$52,956
								<b>TOTAL</b>	<b>\$10,213,005</b>
<b>No.</b>	<b>Expendable Medical Supplies &amp; Equipment</b>								
13	Vacutainer Tubes with Needles - 10 ml (for blood draw for RPR)	10 ml	Tube/Needle	462,528	100	4,625		\$18.00	\$83,250
14	10 ml Syringes and 21 Gauge Needles packed together	10ml	Syringe/Needle	200,244	100	2,002		\$9.00	\$18,018
15	Gloves, Examination Latex Disposable/Non-Sterile (LG) ^^	Large	Box	816,767	50	16,335		\$4.50	\$73,508
16	Gloves, Examination Latex Disposable/Non-Sterile (MED)^^	Medium	Box	816,767	50	16,335		\$4.50	\$73,508
17	Cotton Wool Absorbent swabs (500g)	500g	Box	360,938	100	3,609		\$1.72	\$6,216
18	Gauze pads sterile 10cm x 10cm	100	Box	4,340	100	43		\$7.33	\$315
19	Speculum (stainless steel) for health facilities missed [MED]^	Medium	each	1,000	1	1,000	\$8.20		\$8,200
20	Speculum (stainless steel) for health facilities missed [LG]^	Large	each	1,000	1	1,000	\$8.80		\$8,800
21	Forceps sponge-holding, straight (stainless steel)^		each	300	1	300	\$7.20		\$2,160
								<b>TOTAL</b>	<b>\$273,974</b>
								<b>GRAND TOTAL</b>	<b>\$10,434,022</b>

\*\* Exchange Rate U.S.\$ 1.00 = 1800 Ushs. 4/2002

\*\* Actual WB contract prices not available, so total shipment cost divided by quantity used to estimate unit price. Actual price estimated to be lower since it would exclude freight

^ Price for cefixime found in UNICEF May 2002 document on sources and prices of HIV/AIDS drugs

^^ price from JMS Catalogue February 2002